

**Report 11357
7 December 1998**

**Integrated Advanced Microwave Sounding Unit-A
(AMSU-A)**

Engineering Test Report

METSAT A1 Signal Processor (P/N: 1331670-2, S/N: F04)

**Contract No. NAS 5-32314
CDRL 207**

Submitted to:

**National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771**

Submitted by:

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1.0 Introduction

This report presents a description of the tests performed, and the test data, for the A1 METSAT Signal Processor Assembly PN: 1331679-2, S/N F04. The assembly was tested in accordance with AE-26754, "METSAT Signal Processor Scan Drive Test and Integration Procedure".

The tests were conducted at room temperature in the AMSU-A test area of building 57. The tests fall into six categories: 1) Continuity, 2) Power Distribution, 3) Digital Processor, 4) Analog Processor, 5) Scan Drive, and 6) Supply Current.

2.0 Objective

The objective is to demonstrate functionality of the signal processor prior to instrument integration.

3.0 Test Data

All test data is presented on the enclosed copies of the test data sheets (TDSs) numbered TDS 1 through TDS 10 (Pages A-2 through A-14). Redlines to the data sheets were necessary and were accomplished in accordance with program directive No. 91. Each change was approved by Quality and the test engineer. Changes were made for the following reasons: 1) Test parameter limits were changed due to design changes in the instrument circuitry, 2) Addition of CCA serial number recording locations, and 3) Correction of a typing error. Also included with the test data sheets is the Manufacturing Assembly Instructions list of the CCA card cage slot assignment record listing each CCA part number and serial number.

4.0 TESTS

4.1 Continuity

A complete continuity test of the backplane wiring is performed at the facility where the wirewrapping of the backplane is done. The continuity tests performed here involve 1) the I/O interface card slots, J301 and J326, 2) the Aerojet added Pre-amp/detector signal cable and connector, 3) the Aerojet added Pre-amp/detector power cable and connector, and 4) chassis return connections. The tests are manual resistance measurements tests. Test data is presented on TDS 1.

4.2 Power Distribution

In these tests supply voltages are input to the signal processor from the Test Relay Unit (TRU) as in normal testing. No CCAs are installed in the signal processor for the tests. The test verifies that the four supply voltages are present on the proper pins of all backplane connectors. The test setup block diagram is shown in Figure 1, and test data is presented on TDS 2.

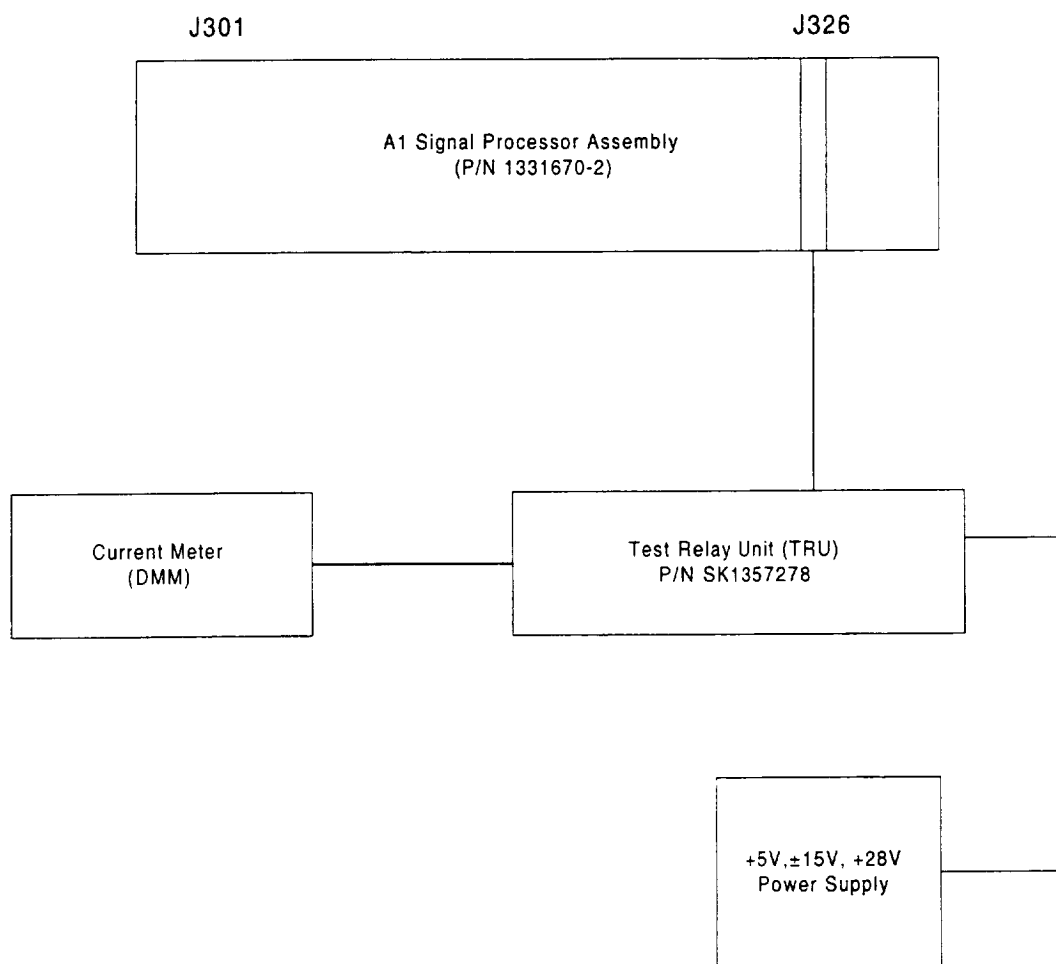


Figure 1. A1 Signal Processor Test Setup

4.3 Digital Processor

Beginning with this test, CCAs are installed into the card cage as required to perform the test, and then remain installed. At the conclusion of all tests, a complete set of CCAs has been installed. The complete test setup block diagram which is required for performing any of the tests is shown in Figure 2.

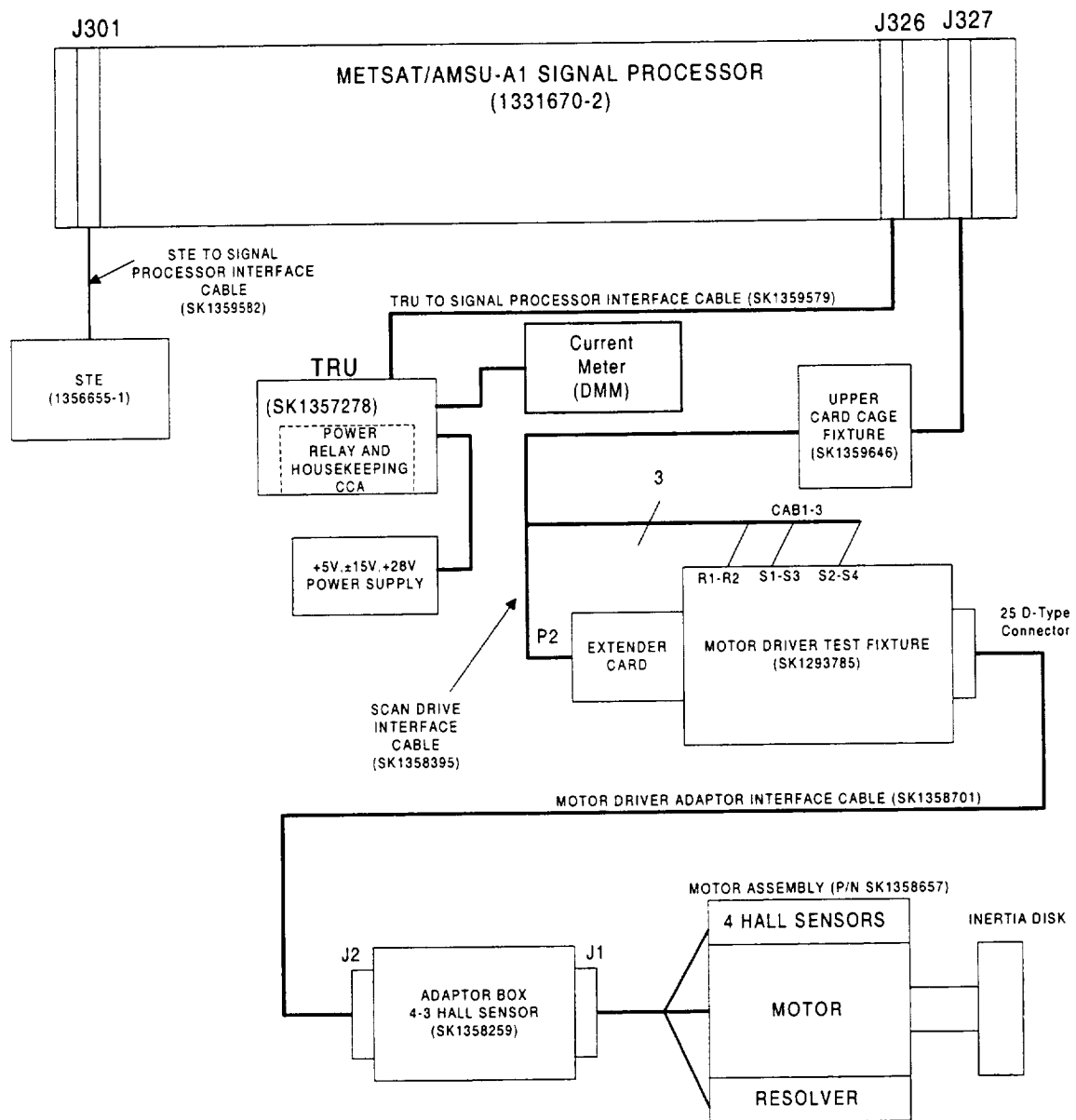


Figure 2 Scan Drive Test Set-Up

4.3.1 Memory

In this test, the digital test set is used in place of the CPU CCA to read and verify data of the test PROMs on the "GOLD" Memory CCA. Test data is presented on TDS 3.

4.3.2 CPU

The CPU test requires that the CPU Auxiliary test CCA be installed in place of the Memory CCA. In this test, the RAM and various instructions performed by the CPU are tested. In addition, the waveform of the clock signal to the DC-DC converter is measured at the CLOCK jack on the TRU. Test data is presented on TDS 3.

4.3.3 Scan Control Interface

In this test, input and output ports 0 through 3 are tested. In addition, the disable feature of the input ports is checked out. Test data is presented on TDS 3.

4.3.4 Timing and Control

In this test, the proper time intervals of I/H, DUMP, INTCMPL, TSCMPL, STOP, and ANTENNA STROBE are verified. In addition to the above tests, the test set also checks the input ports 16 and 17, output port #13 (4 MSBs), output port 14, input port #15 (DAC BSY signal), and output port #13 (4 LSBs). Test data is presented on TDS 3.

4.3.5 Spacecraft Interface

In this test, the STE is turned on and initialized. The STE is tested with a series of self-tests to verify the readiness of the STE to test flight hardware. After successfully passing the self-tests, the STE is used to simulate the spacecraft command signals and retrieve limited test data for the remaining signal processor tests. STE test data is presented on TDS 4.

4.3.6 Relay Control

This test verifies the operation of the module power command and the survival heater command. The presence of the +10 volt Interface power is verified. The PLO lock alarm signals, Scan 1 and 2 relay drive and position indicators, and PLO relay drive and relay position indicators are also verified. Test data is presented on TDS 4.

4.4 Analog Processor

4.4.1 Independence of Measurements

This test is performed using the Analog CCA Test Fixture, the Integrate and Dump Filter and the Analog Mux and A/D Converter CCAs. The test gives a measurement of the sample-to-sample crosstalk within a channel, which is dependent on the completeness of the dump of the integration capacitor. Test data is presented on TDS 5.

4.4.2 Integrate/dump filter, radiometric data multiplexing, and digitization tests

In this test, a 2 volt dc signal is input to each integrate and dump filter, and the channel output code from the A/D converter is measured. The integrator output waveform is also displayed on an oscilloscope for verification of timing. Test data is presented on TDS 6.

4.4.3 Temperature monitoring circuits

In this test a resistor of value approximating the room temperature resistance of the PRTs is connected at the input of each PRT readout circuit, and the output code from the A/D converter is measured. The reference voltage used in the PRT readout circuits is also measured. Test data is presented on TDS 7.

4.4.4 Analog telemetry

In this test each of the analog telemetry signals is measured at the ANALOG HSKP jack on the TRU. Test data is presented on TDS 8.

4.5 Scan Drive

This test includes all CCAs involved in the scan drive function. The circuitry is programmed to provide one complete revolution of the drive motor as it steps through each of the thirty scene positions and the two calibration positions. The circuitry is programmed to park at the Warm Cal, Cold Cal, and the Nadir positions during the test sequence. The GSE test modes are also verified. To verify proper performance, the inertia disk on the motor shaft is visually observed through the one revolution and the various calibration positions. Test data is presented on TDS 9.

4.6 Supply Current

In this test, the total current drawn by the signal processor from each of the four supply voltages is measured with the signal processor fully populated with CCA's. Test data is presented on TDS 10.

5.0 TEST ANOMALIES

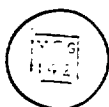
There were three anomalous occurrences during the testing of the A1 Signal Processor. The first anomaly occurred in the middle of the Timing and Control Tests while using the AASPTF (Automatic Digital Test Set). The AASPTF test result indication was "FAIL 000" instead of "PASS". The test setup was checked and determined to be proper so the test was halted and a Test Anomaly Report (attached) was opened (TAR 002370). The anomaly was found to be a short between a wire wrap wire (damaged insulation) and a wire wrap pin on the backplane. The troubleshooting results and stress analysis results are described in the 5 Oct 1998 Haapala memo (attached) as well as a list of overstressed components that were replaced. The backplane was repaired, the overstressed components replaced and the test was resumed at the point of the first anomaly.

The second and third anomalies occurred in the middle and at the end of the Temperature Monitoring Circuits Test. The STE (Special Test Equipment) was being used to verify the Dig. A Temp Data when the anomalies were detected. Dig. A Temp No. 15 data count was above the upper data limit and Dig. A Temp No. 34 data count was below the lower data limit. The test was stopped after the second anomaly and a Test Anomaly Report (attached) was opened (TAR 005052). It was found that the second anomaly was caused by a bad resistor on the Temp. Sensor "B" CCA in card slot J304. The decision was made to continue testing and repair the CCA after the completion of the test. The test was stopped for the third anomaly and the anomaly was also recorded on TAR 005052. The third anomaly was also caused by a bad resistor but on the Temp. Sensor "B" CCA in card slot J305. The test was completed, the two Temp. Sensor "B" CCA's repaired and the failed test sections successfully retested.

6.0 TEST RESULTS

The METSAT/AMSU A1 SIGNAL PROCESSOR TEST was successfully completed and all test data is within specified limits.

GENCORP AEROJET	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)			PAGE	OF
	PART DESCRIPTION SIGNAL PROCESSING ASSY.		PART NUMBER 1331670-2	6	7
PLANNED BY J. DIPASQUALE	DATE 5/08/97	REVISION 01	NEXT ASSEMBLY 1331720-2	OPER 0090	



5. Record Serial Numbers of each CCA below.

d) Record S/N of each CCA in the area noted below, also record S/N on the Data Sheet.

Note: CCA'S will be installed at Operation 0120 per AE-26002/3 Test Procedure.

SEP 28 1998

e) Record Part No. and S/N of CCA required, for location J317 Connector.

LOCATION	ITEM #	CCA PART NO.	SERIAL NO.	DESCRIPTION	COMMENTS
J301					
J302					
J303	2	1338421-1	S/N F14	TEMP. SENSOR A	
J304	3	1331682-1	S/N F28	TEMP. SENSOR BD. "B"	
J305	3	1331682-1	S/N F33	TEMP. SENSOR BD. "B"	
J306	4	1331688-1	S/N F23	Temp.Sensor,ANLG MUX	
J307	5	1356418-1	S/N F08	MUX AND ANLG/DGTL	
J308	6	1338424-1	S/N F20	INTEG. & DUMP FILTER	
J309	6	1338424-1	S/N F35	INTEG. & DUMP FILTER	
J310	6	1338424-1	S/N F44	INTEG. & DUMP FILTER	
J311	6	1338424-1	S/N F45	INTEG. & DUMP FILTER	
J312	7	1331147-1	S/N F14	SPACECRAFT I/F NO.2	
J313	8	1331144-1	S/N F20	SPACECRAFT I/F NO.1	
J314	9	1351150-1	S/N F26	PARALLEL TO SER CNVTR	
J315	10	1331135-1	S/N F06	TIMING AN CONTROL	
J316	11	1356413-2	S/N F01	CPU	
J317	12	*		MEMORY ASSY.	**
J318	13	1331129-1	S/N F25	SCAN CONTROL INTFC	
J319	40	1356911-1	S/N F02	RELAY DRVR & CUR MON	
J320	14	1331697-1	S/N F35	Interface/Converter	***
J321	15	1334972-1	S/N F22	RSLVR DATA ISOL	
J322	16	1337739-1	S/N F26	R-D CONVERTER/OSC	***
J323	14	1331697-1	S/N F36	Interface/Converter	***
J324	15	1334972-1	S/N F23	RSLVR DATA ISOL	
J325	16	1337739-1	S/N F27	R-D CONVERTER/OSC	***
J326					
J327					

* = See table #1 for selection of CCA required at this location.

** = Memory CCA installed at next assembly.

670dash11

*** = Test and select resistors added at system level test.

Not Conformal Coated when installed at next assembly.

Figure #4

TEST DATA SHEET 1
A1 Continuity Tests (4.2.1)

From	To	Signal Name	Pass/Fail
J301-1	P511-3	CH 3 - IN	P
J301-10	P511-13	CH 8 - IN	P
J301-13	P511-15	CH 9 - IN	P
J301-15	P511-17	CH 10 - IN	P
J301-16	P511-19	CH 11 - IN	P
J301-19	P511-21	CH 12 - IN	P
J301-21	P511-23	CH 13 - IN	P
J301-22	P511-25	CH 14 - IN	P
J301-25	P511-1	CH 15 - IN	P
J301-3	P511-5	CH 4 - IN	P
J301-4	P511-7	CH 5 - IN	P
J301-60	E1	CHASSIS GND	P
J301-7	P511-9	CH 6 - IN	P
J301-9	P511-11	CH 7 - IN	P
J301-90	E2	CHASSIS GND	P
J304-43	P512-5	+15V(2)	P
J304-45	P512-24	+15V(2)	P
J304-46	P512-9	15VRTN(2/3)	P
J304-48	P512-29	15VRTN(2/3)	P
J304-49	P512-14	-15V(3)	P
J304-51	P512-15	-15V(3)	P
J305-68	P512-12	PRT35_HI (PRE AMP)	P
J305-72	P512-11	PRT35_LO (PRE AMP)	P
J326-76	E3	CHASSIS GND	P

Assembly No. 1331670-2

Shop Order No. 543652

Serial No. F04

Pass ☒ Fail ☐

Test Engineer [Signature] 11/2/98
(Signature) (Date)

Quality Control [Signature] 11/01/98
(Signature) (Date)

Customer Representative (Flight hardware only) [Signature]
(Signature)

11 '98
(Date)

TEST DATA SHEET 2
A1 Power Distribution (Paragraphs 4.2.2 & 4.2.3)

Power Supply Voltages:

+5.7 ± 0.1V: 5.70
-15.7 ± 0.1V: -15.68

+15.7 ± 0.1V: 15.69
+28.7 ± 0.1V: 28.74

Test Set-up Verified: YES ☒ NO ☐

Para. 4.2.3 Step No.	Connector No.	+5 ±0.5 V	P/F	+15 ±0.3V	P/F	-15 ±0.3V	P/F	+28 ±0.56V	P/F	+9 ±1V*	P/F
7*	J301									9.74	P
1	J303			14.98	P	-14.98	P				
2	J304			14.98	P	-14.98	P				
3	J305			14.98	P	-14.98	P				
4	J306			14.98	P	-14.98	P				
5	J307	4.97	P	14.98	P	-14.98	P				
5	J308			14.98	P	-14.98	P				
5	J309			14.98	P	-14.98	P				
5	J310			14.98	P	-14.98	P				
5	J311			14.98	P	-14.98	P				
5	J312	4.97	P							9.44	P
5	J313	4.97	P							9.44	P
5	J314	4.97	P								
5	J315	4.97	P								
5	J316	4.97	P								
5	J317	4.97	P								
5	J318	4.97	P								
5	J319	4.97	P	14.98	P	-14.98	P	28.01	P		
5	J320	4.98	P	14.98	P	-14.98	P				
5	J321	4.98	P								
5	J322	4.98	P	14.98	P	-14.98	P				
5	J323	4.98	P	14.98	P	-14.98	P				
5	J324	4.98	P								
5	J325	4.98	P	14.98	P	-14.98	P				
6	J327	4.98	P	14.98	P	-14.99	P	27.97	P		

*measured at paragraph 4.2.5.2. test

Assembly No. 1331670-2

Shop Order No. 543652

Serial No. F04

Pass ☒ Fail ☐

Test Engineer [Signature] 11/2/98
(Signature) (Date)

Quality Control [Signature] 11/10/98
(Signature) (Date)

Customer Representative (Flight hardware only)

[Signature]
(Signature) (Date)

TEST DATA SHEET 3 (Sheet 1 of 2)
A1 Digital Processor (Paragraph 4.2.4)

CPU CCA Serial No. (J316) F01
Scan Control Interface CCA Serial No. (J318) F25
Timing and Control CCA Serial No. (J315) F06

4.2.4.1 Memory tests:

4.2.4.1/10 Circle Pass or Fail to indicate the result of the tests :

Pass Fail

If "Fail", record the error code and error description.

Error Code: N/A

Error Description: N/A

4.2.4.2 CPU tests:

4.2.4.2/10

	<u>Measurements</u>	<u>Limits</u>	<u>Pass/Fail</u>
V _{p-p}	<u>3.78V_{pp}</u>	3.30 - 4.94 V	<u>P</u>
T	<u>801ns</u>	761 - 841 ns	<u>P</u>

4.2.4.2/19 Circle Pass or Fail to indicate the result of the CPU tests

Pass Fail

4.2.4.3 Scan Control Interface Tests:

4.2.4.3/16 The input ports 0 and 1 tests

Pass Fail

4.2.4.3/23 Inhibit input port 0 and 1 tests

Pass Fail

4.2.4.3/35 The input ports 2 and 3 tests

Pass Fail

4.2.4.3/43² Inhibit input port 2 and 3 tests

Pass Fail

4.2.4.3/55 The output ports 0 and 1 tests

Pass Fail

TEST DATA SHEET 3 (Sheet 2 of 2)
A1 Digital Processor (Paragraph 4.2.4)

4.2.4.3 Scan Control Interface Tests (Cont):

4.2.4.3/63 The output ports 2 and 3 tests

Pass Fail

If "Fail", record the error code and error description.

Error Code: N/A

Error Description: N/A

4.2.4.4 Timing and Control Tests:

4.2.4.4/13	The Integrate and Hold pulse and the Dump pulse at the card rack slot J308.	Pass	Fail
4.2.4.4/23	The Integrate and Hold pulse and the Dump pulse at the card rack slot J309.	Pass	Fail
4.2.4.4/33	The Integrate and Hold pulse and the Dump pulse at the card rack slot J310.	Pass	Fail
4.2.4.4/43	The Integrate and Hold pulse and the Dump pulse at the card rack slot J311.	Pass	Fail
4.2.4.4/54	The Integrate and Hold pulse and the Dump pulse at the card rack slot J301.	Pass	Fail
4.2.4.4/64	The Antenna Strobe pulse test at J320.	Pass	Fail
4.2.4.4/68	The Antenna Strobe pulse test at J323.	Pass	Fail
4.2.4.4/78	The test of the interface to the Temp. Sensor Analog Mux card rack slot J306.	Pass	Fail
4.2.4.4/89	The test of the interface to the Analog Mux and Converter card rack slot J307.	Pass	Fail

If "Fail", record error code and error description:

Error Code: N/A

Error Description: N/A

Assembly No. 1331670-2

Shop Order No. 543652

Serial No. F04

Pass ✓ Fail

Test Engineer [Signature] 2/11/98
(Signature) (Date)

Quality Control [Signature] 11/9/98
(Signature) (Date)

Customer Representative (Flight hardware only) [Signature] NOV 11 '98
(Signature) (Date)

TEST DATA SHEET 4
A1 Relay Driver Tests (Paragraph 4.2.5.2)

Spacecraft Interface #2 CCA (J312) Ser. No. F14
Spacecraft Interface #1 CCA (J313) Ser. No. F20
Parallel to Serial Converter CCA (J314) Ser. No. F26
Relay Driver And Current Monitor CCA (J319) Ser. No. F02

Test Set-up Verified: Yes ☒ No ☐ STE Self Test: Pass ☒ Fail ☐

Step No.	Test Description	Pass/Fail
23	Module power connects	P
26	Survival heater power turns on	P
27	Survival heater power turns off	P
28	Module power disconnects	P
30	Scanner 1 power turns on	P
31	Scanner 2 power turns on	P
32	Scanner 1 power turns off	P
32	Scanner 2 power turns off	P
34	PLLO toggle	P
35	Module power disconnect	P

Assembly No. 1331670-2

Shop Order No. 543652

Serial No. F04

Pass ☒ Fail ☐

Test Engineer [Signature] 11/2/98
(Signature) (Date)

Quality Control [Signature] 11/2/98
(Signature) (Date)

Customer Representative (Flight hardware only) [Signature]
(Signature) (Date)

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TEST DATA SHEET 5
A1 Independence Of Measurements (Paragraph 4.2.6.1)

Analog Mux and A/D Converter CCA Serial. No. F08

Test Set-up verified: YES ☒ NO ☐

Supply	Measured Value (V)	Limits (V)
+5	<u>4.786</u>	+5 ± 0.25
+15	<u>15.719</u>	+15 ± 1.0
-15	<u>-15.423</u>	-15 ± 1.0

Integrate and Dump/Filter CCA Serial No.	Channel No.	Average for SIGNAL switch in HI position	Average for SIGNAL switch in LO position	Measurement Dependence ≤0.01%	Pass/Fail
F20	0	14046	14043.9	0.0032	P
	1	14034.6	14032.8	0.00274	P
	2	14053.1	14051.1	0.00305	P
	3	14067.2	14066	0.00183	P
F35	0	14013.3	14011.5	0.00274	P
	1	13986.7	13983.5	0.00488	P
	2	14004.9	14002.7	0.00336	P
	3	13994.4	13992	0.00366	P
F44	0	14016	14014.7	0.00198	P
	1	14029.6	14027.9	0.00259	P
	2	14019.8	14017.9	0.0029	P
	3	14020.7	14018.7	0.00305	P
F45	0	14029.9	14027.8	0.0032	P
	1	14029.2	14027.9	0.00198	P
	2	14048	14046	0.00305	P
	3	14053.9	14051.9	0.00305	P

Assembly No. 1331670-2

Shop Order No. 543652

Serial No. F04

Pass ☒ Fail ☐

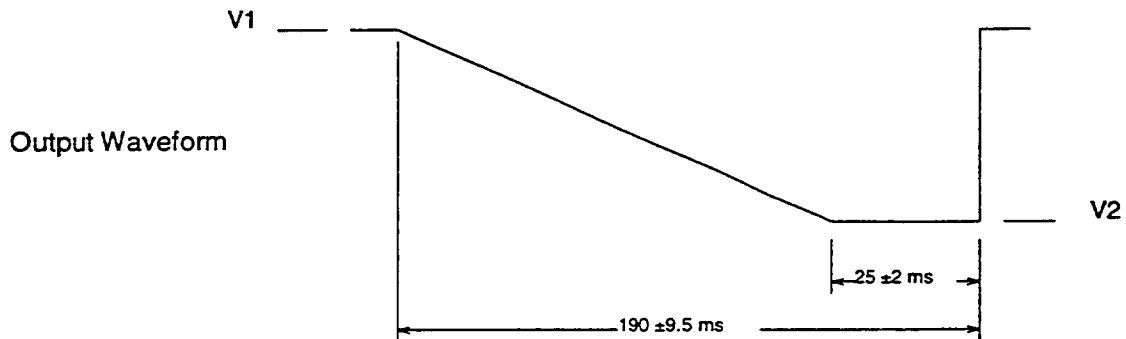
Test Engineer [Signature] 10/28/98
(Signature) (Date)

Quality Control [Signature] 10/28/98
(Signature) (Date)

Customer Representative (Flight hardware only) [Signature] 11 98
(Signature) (Date)

TEST DATA SHEET 6 (Sheet 1 Of 2)
A1 Integrator Signal Multiplexing, And Digitization (Paragraph 4.2.6.2)

Analog Mux and A/D Converter CCA: Ser. No. F08
Integrate and Dump/Filter CCA: Ser. No. F20
Rack Slot J308: Ser. No. F35
Rack Slot J309: Ser. No. F44
Rack Slot J310: Ser. No. F45
Rack Slot J311: Ser. No. F45



Channel	Data	Data Limits	Data Pass/Fail	Integrator Waveform Pass/Fail
3	29005	27282 to 31076	P	P
4	28905	27282 to 31076	P	P
5	28964	27282 to 31076	P	P
6	29017	27282 to 31076	P	P
7	28911	27282 to 31076	P	P
8	28630	27282 to 31076	P	P
9	28916	27282 to 31076	P	P
10	28854	27282 to 31076	P	P
11	28971	27282 to 31076	P	P
12	28973	27282 to 31076	P	P
13	28900	27282 to 31076	P	P
14	28911	27282 to 31076	P	P
15	28910	27282 to 31076	P	P

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TEST DATA SHEET 6 (Sheet 2 Of 2)
A1 Integrator Signal Multiplexing, And Digitization (Paragraph 4.2.6.2)

Signal Name	Output	Output Return	Signal Levels	Pass/Fail
I/H	J301-42	J301-41	Pulses (TTL)	P
Dump	J301-45	J301-41	Pulses (TTL)	P
+5 Vdc GSE Interlock A	J301-61	J301-70	+5 V	P
+5 Vdc GSE Interlock B	J301-62	J301-70	+5 V	P

Assembly No. 1331670-2Shop Order No. 543652Serial No. F04Pass ☒ Fail ☐Test Engineer [Signature] 11/12/98
(Signature) (Date)Quality Control [Signature] 11/12/98 (11/12/98)
(Signature) (Date)Customer Representative (Flight hardware only) [Signature] NOV 11 '98
(Signature) (Date)

TEST DATA SHEET 7 (Sheet 1 of 2)
A1 Temperature Monitoring Circuits (Paragraph 4.2.6.3)

Temperature Sensor A CCA(J303) Serial No. F14
 Temperature Sensor B CCA (J304) Serial No. F28
 Temperature Sensor B CCA (J305) Serial No. _____
 Temperature Sensor Analog Mux CCA (J306) Serial No. F23

Dig. A Temp No.	Description	Data	Data Limits	Pass/Fail
1	Scan Motor A1-1	30924	28259 to 32513	P
2	Scan Motor A1-2	31203	28259 to 32513	P
3	Feedhorn A1-1	31477	28259 to 32513	P
4	Feedhorn A1-2	30862	28259 to 32513	P
5	RF MUX A1-1	30777	28259 to 32513	P
6	RF MUX A1-2	31217	28259 to 32513	P
7	LO CH 3	30762	28259 to 32513	P
8	LO CH 4	30858	28259 to 32513	P
9	LO CH 5	30868	28259 to 32513	P
10	LO CH 6	31129	28259 to 32513	P
11	LO CH 7	31306	28259 to 32513	P
12	LO CH 8	31056	28259 to 32513	P
13	LO CH 15	30879	28259 to 32513	P
14	PLO #2	30936	28259 to 32513	P
15	PLO #1	30851	28259 to 32513	P
16	N/A	N/A	N/A	N/A
17	Mixer IF CH 3	30830	28259 to 32513	P
18	Mixer IF CH 4	31117	28259 to 32513	P
19	Mixer IF CH 5	30841	28259 to 32513	P
20	Mixer IF CH 6	30998	28259 to 32513	P
21	Mixer IF CH 7	31338	28259 to 32513	P
22	Mixer IF CH 8	31002	28259 to 32513	P
23	Mixer IF CH 9/14	31080	28259 to 32513	P
24	Mixer IF CH 15	30951	28259 to 32513	P
25	IF Amp CH 11/14	31066	28259 to 32513	P
26	IF Amp CH 9	31256	28259 to 32513	P
27	IF Amp CH 10	30856	28259 to 32513	P
28	IF Amp CH 11	30992	28259 to 32513	P
29	DC/DC Conv	31046	28259 to 32513	P
30	IF Amp CH 13	30931	28259 to 32513	P
31	IF Amp CH 14	30986	28259 to 32513	P
32	IF Amp CH 12	30884	28259 to 32513	P
33	RF Shelf A1-1	30953	28259 to 32513	P
34	RF Shelf A1-2	31060	28259 to 32513	P
35	Detector/Preamp	31096	28259 to 32513	P

TAR
0050:

TAR
0050:

11 June 98

TEST DATA SHEET 7 (Sheet 2 of 2)
A1 Temperature Monitoring Circuits (Paragraph 4.2.6.3)

Dig. A Temp No.	Description	Data	Data Limits	Pass/Fail
36	A1-1 Warm Load 1	22345	20339 to 23401	P
37	A1-1 Warm Load 2	22446	20339 to 23401	P
38	A1-1 Warm Load 3	22453	20339 to 23401	P
39	A1-1 Warm Load 4	22277	20339 to 23401	P
40	A1-1 Warm Load C	22623	20339 to 23401	P
41	A1-2 Warm Load 1	22431	20339 to 23401	P
42	A1-2 Warm Load 2	22385	20339 to 23401	P
43	A1-2 Warm Load 3	22358	20339 to 23401	P
44	A1-2 Warm Load 4	22241	20339 to 23401	P
45	A1-2 Warm Load C	22623	20339 to 23401	P
46	Thermal Reference	25137	23340 to 26320	P

Assembly No. 1331670-2Shop Order No. 543652Serial No. E04Pass ☒ Fail ☐Test Engineer [Signature] 11/10/98
(Signature) (Date)Quality Control [Signature] 11/10/98
(Signature) (Date)7A
200Customer Representative (Flight hardware only) [Signature] 11/13/98
(Signature) (Date)

TEST DATA SHEET 8
A1 Analog Telemetry (Paragraph 4.2.6.4)

ANALOG HSKP Switch Position	DVM Reading (V)	Limits (V)	Pass/Fail
1	2.995	2.85 to 3.15	P
2	3.462	3.30 to 3.66	P
3	2.972	2.87 to 3.17	P
4	3.01	2.85 to 3.15	P
5	3.455	3.30 to 3.66	P
6	2.983	2.87 to 3.17	P
7	3.452	3.30 to 3.66	P
8	2.977	2.87 to 3.17	P
9	2.981	2.85 to 3.15	P
10	3.572	3.42 to 3.78	P
11	3.266	3.13 to 3.45	P
12	2.965	2.84 to 3.14	P
13	2.957	2.84 to 3.14	P
14	2.963	2.84 to 3.14	P
15	2.969	2.84 to 3.14	P
16	2.972	2.84 to 3.14	P
17	2.968	2.84 to 3.14	P
18	3.45	3.30 to 3.66	P
19	0.059	4.30 to 4.66 ^{-0.1 to 0.1}	P
19	-4.04	0.4 to 0.48 ^{-3.7 to -4.3}	P
20	0.068	4.30 to 4.66 ^{-0.1 to 0.1}	P
20	-4.03	0.4 to 0.48 ^{-3.7 to -4.3}	P
21	0.007	-0.05 to 0.05	P
21	2.955	2.8 to 3.4	P
22	-0.006	-0.05 to 0.05	P
22	2.943	2.8 to 3.4	P

1964
9/18/98
QA
228

Assembly No. 1331670-2

Shop Order No. 54365-2

Serial No. F04

Pass ☒ Fail ☐

Test Engineer [Signature] 11/12/98
(Signature) (Date)

Quality Control [Signature] 11/10/98
(Signature) (Date)

Customer Representative (Flight hardware only) [Signature]
(Signature) (Date)

TEST DATA SHEET 9
A1 Scan Drive/ Signal Processor Tests (Paragraph 4.3.1 And 4.3.2)

A1-1 Drive Subsystem CCAs:

Interface Converter CCA (J320) Ser. No. F35
Resolver Data Isolator CCA (J321) Ser. No. F22
R/D Converter/Oscillator CCA (J322) Ser. No. F26
Motor Drive 3-Hall Sensor CCA (J404) Ser. No. F07
Test Set-up Verified: Yes ☒ No ☐

19 Feb
9/28/98
QC
229

Para/Step No.	Mode	Pass/Fail
4.3.1.2.1/11	Motor in warm cal position	P
4.3.1.2.2/3	Motor in nadir position	P
4.3.1.2.3/2	Motor in cold cal position 1	P
4.3.1.2.3/3	Motor in cold cal position 2	P
4.3.1.2.3/4	Motor in cold cal position 3	P
4.3.1.2.3/5	Motor in cold cal position 4	P
4.3.1.2.4/5	Motor in full scan mode	P
4.3.1.2.5/9	GSE mode 2	P
4.3.1.2.6/4	GSE mode 4	P
4.3.1.2.7/4	GSE mode 5	P
4.3.1.2.8/4	GSE mode 1	P
4.3.1.2.9/4	GSE mode 3	P
4.3.1.2.9/7	GSE mode 7	P
4.3.1.2.10/2	Scan power off	P

A1-2 Drive Subsystem CCAs:

Interface Converter CCA (J323) Ser. No. F36
Resolver Data Isolator CCA (J324) Ser. No. F23
R/D Converter/Oscillator CCA (J325) Ser. No. F27
Motor Drive 3-Hall Sensor CCA (J404) Ser. No. F12
Test Set-up Verified: Yes ☒ No ☐

19 Feb
9/28/98
QC
229

Para. No./Step No.

4.3.2.2 A1-2 scan drive operates in full scan mode. Pass ☒ Fail ☐

Assembly No. 1331670-2

Shop Order No. 543652

Serial No. F04

Pass ☒ Fail ☐

Test Engineer [Signature] 11/2/98
(Signature) (Date)

Quality Control [Signature] 11/10/98
(Signature) (Date)

Customer Representative (Flight hardware only) [Signature] 11/11/98
(Signature) (Date)

TEST DATA SHEET 10
A1 Supply Currents (Paragraph 4.4)

Voltages	Measured Current	Limits (in mA)	Pass/Fail
+28.7V	7.6	6 to 12	P
+5.7V	670	700 to 1642 550 to 900	P
+15.7V	196	152 to 364	P
-15.7V	192	162 to 381	P

Date
9/28/98
223

Assembly No. 1331670-2

Shop Order No. 643652

Serial No. F04

Pass ☒ Fail ☐

Test Engineer D. Lusk 11/2/98
(Signature) (Date)

Quality Control Chill & Gonzalez 11/8/98
(Signature) (Date)

7A
200

Customer Representative (Flight hardware only) J. Lusk NOV 11 '98
(Signature) (Date)

AR NO. 002370

EST ANOMALY RECORD

REF. MPI 00-005)

SYSTEM NO.

DATE 9/30/98 Page 1 of 3

SPEC (MPI (AE)...) 26754 REV

CUMULATIVE TIME hrs min

ELAPSED TIME hrs min

ASSY NAME AI METSAT
SIGNAL PROCESSOR

ASSY P/N 1331670-2 REV

ASSY S/N F04

S/O NO. 543652

TEST OPER NO. 0120 STEP A

rst time for failure at this point? YES ☒ NO ☐ Test Proc Para No. where failure occurred 4.2.4.4

ype of test (EXP: T/C 1 FFT HOT) FUNCTIONAL Para Step No. 53 54

DESCRIPTION OF ANOMALY (LIST EXPECTED AND RECORDED VALUES): EXPECTED READOUT ON AASPTF IS
'PASS', READOUT WAS 'FAIL 000.'

TECH/TE NOTIFIED TEAM LEADER NAME DEFECT CODE T20 TECH DATE 9/30/98

INSTRUCTIONS:

OPER. STATION

002 TEST Test to notify inspection of failure/anomaly. (Except engineering, MPI or Pretest.)

005 INSP. Inspection to notify DCMC of failure / anomaly. (GFE)

TROUBLESHOOT/REWORK/RETEST ACTION PLAN:

TROUBLESHOOT TO DETERMINE REASON FOR FAIL INDICATION

NOTE: Remove pink copy here. Deliver to QA drop box.

TROUBLESHOOT/REWORK/RETEST/INSTRUCTIONS:

OPER. STATION

			PROD	INSP	RMKS
010	TEST	USING OSCILLOSCOPE, LOOK FOR TIMING SIGNALS ON J301 OF CARD CAGE (THESE ARE THE SIGNALS MEASURED IN THIS TEST USING THE AASPTF). RESULT: SIGNALS HAD A BASELINE OF ~13V. SHOULD BE EITHER ZERO OR 5V.	9/30/98		
012	TEST	USING DVM, LOOK FOR PRESENCE OF DC VOLTAGE ON ALL PINS OF J301 WITH AASPTF CABLE TO J301 REMOVED. RESULT: FOUND 15V ON PIN 21. NO PINS OF J301 SHOULD HAVE DC VOLTAGE AT THIS POINT IN TEST.	9/30/98		
014	TEST	REMOVE ALL ITEMS FROM CARD CAGE AND RETURN IT TO MKG. TO LOOK FOR SHORT IN BACKPLANE WIRING. EXPECT CAUSE OF SHORT TO BE NEAR J304-43THRU 45 (15V). WIRE-WRAP WIRE TO	9/30/98		

NOTE: For parts replacement continuation page is MANDATORY

PASSED Retest/Start DATE	TECH	FAILED Retest/Start DATE	TECH	GO TO S/O (CONT) OR OPERATION 5014	PAGE 2 OF THIS TAB	TE/ME	QE
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WHAT WAS THE CAUSE OF THE ANOMALY?

WIRE-WRAP WIRE ON J301-21 HAD
BROKEN INSULATION AND SHORTED TO
J304-43

CORRECTIVE ACTION:

REMOVE AND REPLACE WIRE-WRAP WIRE
SEE ATTACHED MEMO, DATED 10/5/98DATE 10/28/98
TEAM LEADER

TAR NO. 002370

CONTINUATION

ASSY NAME ALMETSAT SIG. PROC.ASSY P/N 1331670-2 REV ASSY S/N F04

PFI MPI 00-005)

DATE 10/1/98 Page 2 of 3

ADDITIONAL DESCRIPTION OF ANOMALY:

☒ If checked, see previous page(s) for anomaly and defect codeDEFECT CODE T20

TROUBLESHOOT/REWORK/RETEST ACTION PLAN:

☐ If checked, see previous page(s) for action plan.

NOTE: Remove pink copy here. Deliver to QA drop box.

TE/TEAM LEADER

QE/INSPECTOR

DATE

TROUBLESHOOT/REWORK/RETEST/INSTRUCTIONS

OPER.	STATION		PROD	INSP	RMKS
8014	TEST	PIN 21 OF J301 MAY RUN PAST THESE PINS, AND THEY HAVE HAD OTHER WIRES SOLDERED TO THEM.	NA		
(CONT.)					
8016	MFG	LOOK FOR BACKPLANE WIRING SHORT (J301-21 TO +15V)			
8018	MFG	- UNWRAP 30GA. WIRES AT J301 PIN 4 (ORANGE) AND PIN 67 (ORANGE). W/NTHREAD LOOSE ENDS BACK TO ORIGINATOR AT J301 PIN 21 (BLUE) AND PIN 24 (ORANGE).			
8020	MFG	- EXAMINE WIRES FOR CUT INSULATION OR OTHER POTENTIAL DAMAGE.			
		- RESULTS: BLUE WIRE SHOWS A ABRASION AREA NEAR THE SOLDERED POSTS.			
		- UNSOLDER CONNEX.			
8022	MFG	- CUT WIRES AT J301 PINS 21, 24 AND UNSOLDER WIRE AT PIN J301 PIN 21, UNWRAP & REMOVE WIRE AT 24, 24			
8023	INSP	- PLACE DISCREPANCY ON IR FOR MRB DISPOSITION IR # 104191			
		GO TO SHOP ORDERS 625531, 625532 & 625533.			
8030	TEST	RETEST Para. 4.2.4.4 STEP 54. NOTIFY INSP OF START OF RETEST PRIOR TO PERFORMING THE TEST			

N/A
TECHPASSED
Retest/Start
DATEN/A
TECHFAILED
Retest/Start
DATEGO TO S/O (CONT.) OR
OPERATION 8035PAGE 3 OF THIS TAR

TE/ME

QE

PARTS REMOVED/ASSEMBLIES

☐ N/A BEYOND THIS POINT

REPLACEMENT PARTS/ASSEMBLIES

LOC.	DEFECT	A/T#OR D/C	PART#	S/N	LOT#	LOC.	ACCEPT TAG# OR D/C	PART #	S/N

Deliver completed yellow copy to QA drop box; Completed original to parent S/O

TAR NO. 002370

CONTINUATION

ASSY NAME A1-METSAT SIG-PRCCASSY P/N 1331670-2 REV ASSY S/N F04

MPI 00-005)

DATE 10/28/98 Page 3 of 3

ADDITIONAL DESCRIPTION OF ANOMALY:

☒ If checked, see previous page(s) for anomaly and defect codeDEFECT
CODET20

TROUBLESHOOT/REWORK/RETEST ACTION PLAN:

☒ If checked, see previous page(s) for action plan.

NOTE: Remove pink copy here. Deliver to QA drop box.

TE/TEAM LEADER

QE

RE

DATE

TROUBLESHOOT/REWORK/RETEST/INSTRUCTIONS

OPER. STATION

8035 INSP. A. VERIFY TEST SET-UP USING PREVIOUS GU-TEST

B. NOTIFY DCMC @ START OF RETEST.

1st PROD 2nd INSP RMKS

OK TO CLOSE THIS TAR

10/28/98

PASSED
Retest/Start
TECH DATE
10/28/98FAILED
Retest/Start
TECH DATEGO TO S/O CONT., OR
OPERATION0120

PAGE

10TE/ME
10/28/98

QE

PARTS REMOVED/ASSEMBLIES

☐ N/A BEYOND THIS POINT

REPLACEMENT PARTS/ASSEMBLIES

LOC.	DEFECT	A/T#OR D/C	PART#	S/N	LOT#	LOC.	ACCEPT TAG# OR D/C	PART #	S/N

Deliver completed yellow copy to QA drop box; Completed original to parent S/O

TEST DATA SHEET 3 (Sheet 2 of 2)
A1 Digital Processor (Paragraph 4.2.4)

4.2.4.3 Scan Control Interface Tests (Cont):

4.2.4.3/63 The output ports 2 and 3 tests

Pass Fail

If "Fail", record the error code and error description.

Error Code:

N/A

Error Description:

N/A

4.2.4.4 Timing and Control Tests:

4.2.4.4/13	The Integrate and Hold pulse and the Dump pulse at the card rack slot J308.	<u>Pass</u>	Fail
4.2.4.4/23	The Integrate and Hold pulse and the Dump pulse at the card rack slot J309.	<u>Pass</u>	Fail
4.2.4.4/33	The Integrate and Hold pulse and the Dump pulse at the card rack slot J310.	<u>Pass</u>	Fail
4.2.4.4/43	The Integrate and Hold pulse and the Dump pulse at the card rack slot J311.	<u>Pass</u>	Fail
4.2.4.4/54	The Integrate and Hold pulse and the Dump pulse at the card rack slot J301.	Pass	<u>Fail</u> ^{TAR} 002370
4.2.4.4/64	The Antenna Strobe pulse test at J320.	Pass	Fail
4.2.4.4/68	The Antenna Strobe pulse test at J323.	Pass	Fail
4.2.4.4/78	The test of the interface to the Temp. Sensor Analog Mux card rack slot J306.	Pass	Fail
4.2.4.4/89	The test of the interface to the Analog Mux and Converter card rack slot J307.	Pass	Fail

If "Fail", record error code and error description:

Error Code:

Error Description:

Assembly No. _____

Shop Order No. _____

Serial No. _____

Pass _____ Fail _____

Test Engineer _____
(Signature) (Date)

Quality Control _____
(Signature) (Date)

Customer Representative (Flight hardware only) _____
(Signature) (Date)



INTEROFFICE MEMO

Azusa Site

5 Oct 1998

To: A. Nieto
From: C. A. Haapala
Subject: Test Failure During Test Of A1 METSAT Signal Processor, F04
Copies To: R. V. Hauerwaas, E. Lorenz, D. L. Lund

During the subject test, a failure occurred when using the AASPTF (Digital Test Set) to check for the Integrate/Hold and Dump signals at J301 of the signal processor. This is an automated test controlled by the AASPTF, and three flight CCAs are in the signal processor at the time of this test.

In the process of troubleshooting, an oscilloscope was used to view the Integrate/Hold and Dump signals on pins 42 and 45 respectively on J301. Both were found to have a baseline near 15V, and these are normally 0 to 5V logic signals. Next, +15V was found on J301-21. At this point in testing, there should be no dc voltage on any pins of J301. With all CCAs removed from the signal processor, continuity was measured between the +15V bus and J301-21. This confirmed that there was a backplane wiring problem, and subsequent examination revealed that the insulation on a wire-wrap wire going from J310-64 to J301-21 had been broken, allowing contact of the wire to the wire-wrap post on J304-43, by which it was routed. This is a +15V pin, and it is also a connection point for +15V going to the Detector/Preamplifier assembly. In addition to wire-wrap wires, it has a stranded wire soldered to it.

This wiring failure caused the +15V to be applied to U23-4 (the Dump signal output) of the Timing and Control CCA by virtue of the fact that J301-21 and J301-45 are tied together in the AASPTF. In the EOS signal processor, the Dump signal is on J301-21, and the AASPTF was designed for commonality in testing in the case of these particular signals.

U23 is a CMOS buffer, CD4050B, supplied by +5V. Inside the 4050, there is a diode to VCC (+5V). Therefore, when the output is connected to a voltage source which is more than a diode voltage higher than VCC, the VCC supply will be pulled up by the other source. In this case, the VCC supply was pulled up close to +15V, and all parts powered the +5V had the higher voltage applied. Some of these parts have a 7V absolute maximum rating, and may have been degraded, or even damaged. These should be replaced. A summary of the reference designations for these parts is given at the end of this memo. The other ICs powered by +5V have a 20V rating.

The failure conditions were set up in the lab on an individual CD4050B. It was found that the current into the device output (pin 4) starts to increase significantly when the voltage on the output is about one volt above the supply, and it continues to increase to over 200 mA as the voltage on the output continues to increase. Because of this relatively high current, there may have been some overstress on this part, and so it should also be replaced.

On the CPU CCA a tantalum capacitor (C1) had its maximum rated voltage exceeded, and should be replaced.

The summary of reference designations by CCA, for parts to be replaced, is given below.

1331129 Scan Control Interface: U1-U9
1331135 Timing and Control: U1-U6, U18, U23
1356413 CPU: C1, U4, U5, U7, U10-U14

C. A. Haapala
Analog Electronics and Components
Electrical Engineering

TAR NO. 005052

SYSTEM NO. _____

TEST ANOMALY RECORD

DATE 10/28/98 Page 1 of 4SPEC (MPI, AE, ...) 26754 REV A

CUMULATIVE TIME _____ hrs _____ min

ELAPSED TIME _____ hrs _____ min

ASSY NAME HETSAT A1
SIGNAL PROCESSORASSY P/N 1331670-2 REV _____ASSY S/N F04S/O NO. 543652TEST OPER NO. 0120 STEP 4

REF. MPI 00-005)

First time for failure at this point? YES ☒ NO ☐ Test Proc Para No. where failure occurred 4, 2.6.3Type of test (EXP: T/C 1 FFT HOT) FUNCTIONAL Para Step No. 36DESCRIPTION OF ANOMALY (LIST EXPECTED AND RECORDED VALUES): READOUT ON STE SHOULD BE
BETWEEN 28259 TO 32513. DIG. A TEMP NO. 15 IS 32767. CIRCUITRY IS
ON CCA 1331682-1 IN J304.

TECH/ITE NOTIFIED TEAM LEADER NAME _____

DEFECT CODE 720TECH [Signature] DATE 10/28/98

INSTRUCTIONS:

OPER. STATION

002 TEST Test to notify inspection of failure/anomaly. (Except engineering, MPI or Pretest.)005 INSP Inspection to notify DCMC of failure / anomaly. (GFE)

TROUBLESHOOT/REWORK/RETEST ACTION PLAN:

Continue test with suspect Temp B CCA. Use of this board
will not effect any other data. After test completion,
troubleshoot CCA - OK to proceed per Harrisman, NASA (Keroy)
At 3:45 p.m. 10/28/98 TROUBLESHOOT CCA AFTER COMPLETION OF TEST.CCA IS 1331682-1 F28 IN J304

NOTE: Remove pink copy here. Deliver to QA drop box.

TE [Signature] RE [Signature] DATE 10/28/98
TEAM LEADER [Signature]

TROUBLESHOOT/REWORK/RETEST/INSTRUCTIONS:

OPER. STATION

OPER.	STATION		PROD	INSP	RMKS
010	TEST	TROUBLESHOOT CCA 1331682-1 F28 TO DETERMINE CAUSE FOR OUT OF LIMIT READING	<u>[Signature]</u> 11/3/98		
012	TEST	INSPECT MEASURE VOLTAGES IN U7 CIRCUIT. RESULT: ALL NORMAL EXCEPT OUTPUT	<u>[Signature]</u> 11/3/98		
014	MFG	INSPECT SOLDER JOINTS ON R32 AND R35 RESULT:	<u>[Signature]</u> 11-3-98		
016	MFG	REMOVE LIFT LEAD OF R35 (END TOWARD OUTSIDE EDGE OF BOARD)	<u>[Signature]</u> 11-3-98		

NOTE: For parts replacement continuation page is MANDATORY

PASSED
Retest/Start
TECH DATEFAILED
Retest/Start
TECH DATEGO TO S/O, CONT. OR
OPERATION 8018PAGE 2 OF THIS TARTE/ME [Signature] DATE 10/29/98
QE [Signature]

WHAT WAS THE CAUSE OF THE ANOMALY?

3AD RESISTORS R35 ON 1331682-1
F28 AND R34 ON 1331682-1 F33

CORRECTIVE ACTION:

REMOVE AND INSTALL NEW RESISTORS.
SEND RESISTORS WHICH WERE
REMOVED FOR FAILURE ANALYSIS.QE [Signature] DATE 11/10/98
TEAM LEADER

TAR NO. 005052

CONTINUATION

ASSY NAME METSAT A1
SIGNAL PROCESSORASSY P/N 1331670-2 REV ASSY S/N F04

MPI 00-005)

DATE 10/29/98 Page 2 of 4

ADDITIONAL DESCRIPTION OF ANOMALY:

☐ If checked, see previous page(s) for anomaly and defect codeDEFECT CODE T20

WHILE CONTINUING TEST, ANOTHER TEMP SENSOR CHANNEL READOUT WAS OUT OF LIMITS
 READOUT ON STE SHOULD BE BETWEEN 28259 TO 32513. DIG. A TEMP. NO. 23 IS
 24858. CIRCUITRY IS ON SCA 1331682-1 F33 IN J305. 34

TROUBLESHOOT/REWORK/RETEST ACTION PLAN:

☒ If checked, see previous page(s) for action plan.

SAME AS ON PG. 1 EXCEPT SCA IS 1331682-1 F33 IN J305

NOTE: Remove pink copy here. Deliver to QA drop box.

TE/TEAM LEADER [Signature] DATE 10/29/98

TROUBLESHOOT/REWORK/RETEST/INSTRUCTIONS

OPER.	STATION		PROD	INSP	RMKS
3018	MFG	SOLDER BUS WIRE PIGTAIL ON END OF R32 NEXT TO U7	<u>[Signature]</u> 11-3-98		
3020	TEST	MEASURE RESISTANCE OF R35 (AS8089-13B) RESULT: VALUE VARIES BETWEEN APPROX. 1.6 MΩ TO 1.8 MΩ. SHOULD BE 300 kΩ	<u>[Signature]</u> 11/3/98		
3022	TEST	USING CLIP LEADS CONNECT A 301 kΩ RESISTOR IN PLACE OF R35 AND MEASURE OUTPUT. RESULT: -2.697V (NORMAL)	<u>[Signature]</u> 11/5/98		
3024	MFG.	R35 IS BAD. REPLACE WITH NEW R35 (AS8089-13B) TRACE I.D. L00029424 PER S/HOP ORDER 636906. PLACE OLD R35 IN FAILED HARDWARE ENVELOPE AND ROUTE TO RELIABILITY ENGR, ATTN: EMIL LORENZ, FOR FAILURE ANALYSIS. <u>[Signature]</u>	<u>[Signature]</u> 11-10-98		
3025	INSP	PLACE OLD R35 ON MONTHLY LINE LOSS IR # 104158 NOTE: OK TO PERFORM OP. 8065 THRU OP. 8080 IN PARALLEL WITH OP. 8025. GO TO OP. 8020 FOR RETEST OF CCA 1331682-1, F28.	<u>[Signature]</u> 11-11-98		

ECH

PASSED
Retest/Start
DATE

TECH

FAILED
Retest/Start
DATEGO TO S/O, CONT. OR
OPERATION 8070PAGE 3 OF THIS TARTE/ME
DATE 11/3/98

PARTS REMOVED/ASSEMBLIES

☐ N/A BEYOND THIS POINT

REPLACEMENT PARTS/ASSEMBLIES

LOC.	DEFECT	A/T#OR D/C	PART#	S/N	LOT#	LOC.	ACCEPT TAG# OR D/C	PART #	S/N

Deliver completed yellow copy to QA drop box; Completed original to parent S/O

TAR NO. 005052

CONTINUATION

ASSY NAME METSAT A1
SIGNAL PROCESSORASSY P/N 1331670-2 REV ASSY S/N FO4

MPI 00-005)

DATE 11/3/98 Page 3 of 4

ADDITIONAL DESCRIPTION OF ANOMALY:

☒ If checked, see previous page(s) for anomaly and defect codeDEFECT CODE T20

PG. 2

TROUBLESHOOT/REWORK/RETEST ACTION PLAN:

☒ If checked, see previous page(s) for action plan.

PG. 2

NOTE: Remove pink copy here. Deliver to QA drop box.

TE/TEAM LEADER [Signature] DATE 11/3/98

TROUBLESHOOT/REWORK/RETEST/INSTRUCTIONS

OPER.	STATION		PROD	INSP	RMKS
8040	TEST	TROUBLESHOOT CCA 1331682-1 F33 TO DETERMINE CAUSE FOR OUT OF LIMITS READING (LOW)	<u>[Signature]</u> 11/3/98		
3042	TEST	MEASURE VOLTAGES IN U7 CIRCUIT. RESULT: ALL NORMAL EXCEPT OUTPUT	<u>[Signature]</u> 11/3/98		
4	MFG	LIFT LEAD OF R35 (END TOWARD OUTSIDE EDGE OF BOARD)	<u>[Signature]</u> 11-3-98		
046	MFG	SOLDER BUS WIRE PIGTAIL ON END OF R32 NEXT TO U7	<u>[Signature]</u> 11-3-98		
048	TEST	MEASURE RESISTANCE OF R35 RESULT 300.63 k Ω OK	<u>[Signature]</u> 11/3/98		
050	MFG	RESOLDER R35. LIFT END OF R32 NEXT TO U7 LEAVE RETA TOWARD OUTSIDE EDGE OF BOARD	<u>[Signature]</u> 11-3-98		
060	TEST	MEASURE RESISTANCE OF R32 RESULT: 15.615 k Ω OK, BUT OUTPUT STILL LOW WHEN R32 IS PUSHED BACK INTO PAD	<u>[Signature]</u> 11/3/98		

☒ PASSED
Retest/Start
DATE

☒ FAILED
Retest/Start
DATE

GO TO S/O, CONT, OR
OPERATION 8062PAGE 4 OF THIS TARTE/ME [Signature]
QE [Signature]

PARTS REMOVED/ASSEMBLIES

☐ N/A BEYOND THIS POINT

REPLACEMENT PARTS/ASSEMBLIES

LOC.	DEFECT	A/T#OR D/C	PART#	S/N	LOT#	LOC.	ACCEPT TAG# OR D/C	PART #	S/N

Deliver completed yellow copy to QA drop box; Completed original to parent S/O

TAR NO. 005052

CONTINUATION

 ASSY NAME METSAT A1
 ASSY P/N 331670-2 REV
 ASSY S/N F04

P.F. MPI 00-005)

DATE 11/4/98 Page 4 of 4

ADDITIONAL DESCRIPTION OF ANOMALY:

☒ If checked, see previous page(s) for anomaly and defect code

DEFECT CODE

T20PG. 2

TROUBLESHOOT/REWORK/RETEST ACTION PLAN:

☒ If checked, see previous page(s) for action plan.
PG. 2

NOTE: Remove pink copy here. Deliver to QA drop box.

TE/TEAM LEADER 11/4/98 QEI 11/4/98 DATE 11/4/98

TROUBLESHOOT/REWORK/RETEST/INSTRUCTIONS

OPER.	STATION		PROD	INSP	RMKS
8062	TEST	FOUND THAT OUTPUT VARIES SIGNIFICANTLY WHEN FORCE IS EXERTED ON R34. THIS DID NOT OCCUR WITH THE OTHER RESISTORS IN THE CIRCUIT.			
7064	MFG	R34 IS BAD. REPLACE WITH NEW R34 (AS8089-11B) TRACE I.D. L00029207, PER SHOP ORDER 636906 PLACE OLD R34 IN FAILED HARDWARE ENVELOPE AND ROUTE TO RELIABILITY ENGR., ATTN: EMIL LORENZ, FOR FAILURE ANALYSIS.			
8065	INSP	PLACE OLD R34 ON MONTHLY LINE LOSS I.R.# 104158 NOTE: OK TO PERFORM OP. 8070 THEN OP. 8080 IN PARALLEL WITH OP. 8065. THIS COMPLETES ALL REWORK. RETURN TO NEXT QA.			
8070	TEST	SET UP TEST EQUIPMENT TO RETEST PER AE-26754 PARA 4.2.6.3. AND NOTIFY INSP. TO VERIFY TEST SET-UP AND START OF TEST.			
8075	INSP.	A. VERIFY TEST SET-UP USING PREVIOUS GU-TEST. NOTE ANY CHANGES WITH STAMP AND DATE B. NOTIFY DCMC OF START OF RETEST AND MONITOR TEST.			
8080	TEST	RETEST PER AE-26754 PARA. 4.2.6.3. STEPS 36 & 46.			
PASSED Retest/Start DATE <u>11/10/98</u> ECH <u>11/10/98</u>		FAILED Retest/Start DATE <u> </u> TECH <u> </u>	GO TO S/O, CONT., OR OPERATION <u>0120</u> PAGE <u>10</u>		TEAM QEI <u>11/10/98</u>

PARTS REMOVED/ASSEMBLIES

☐ N/A BEYOND THIS POINT

REPLACEMENT PARTS/ASSEMBLIES

LOC.	DEFECT	A/T#OR D/C	PART#	S/N	LOT#	LOC.	ACCEPT TAG# OR D/C	PART #	S/N

Deliver completed yellow copy to QA drop box; Completed original to parent S/O


TEST DATA SHEET 7 (Sheet 1 of 2)
A1 Temperature Monitoring Circuits (Paragraph 4.2.6.3)

Temperature Sensor A CCA(J303) Serial No. F14
Temperature Sensor B CCA (J304) Serial No. F28
Temperature Sensor B CCA (J305) Serial No. _____
Temperature Sensor Analog Mux CCA (J306) Serial No. F23

Dig. A Temp No.	Description	Data	Data Limits	Pass/Fail
1	Scan Motor A1-1	30924	28259 to 32513	P
2	Scan Motor A1-2	31203	28259 to 32513	P
3	Feedhorn A1-1	31477	28259 to 32513	P
4	Feedhorn A1-2	30862	28259 to 32513	P
5	RF MUX A1-1	30777	28259 to 32513	P
6	RF MUX A1-2	31217	28259 to 32513	P
7	LO CH 3	30762	28259 to 32513	P
8	LO CH 4	30858	28259 to 32513	P
9	LO CH 5	30868	28259 to 32513	P
10	LO CH 6	31129	28259 to 32513	P
11	LO CH 7	31306	28259 to 32513	P
12	LO CH 8	31056	28259 to 32513	P
13	LO CH 15	30879	28259 to 32513	P
14	PLO #2	30936	28259 to 32513	P
15	PLO #1	32767	28259 to 32513	F
16	N/A	N/A	N/A	N/A
17	Mixer IF CH 3	30830	28259 to 32513	P
18	Mixer IF CH 4	31117	28259 to 32513	P
19	Mixer IF CH 5	30841	28259 to 32513	P
20	Mixer IF CH 6	30998	28259 to 32513	P
21	Mixer IF CH 7	31338	28259 to 32513	P
22	Mixer IF CH 8	31002	28259 to 32513	P
23	Mixer IF CH 9/14	31080	28259 to 32513	P
24	Mixer IF CH 15	30951	28259 to 32513	P
25	IF Amp CH 11/14	31066	28259 to 32513	P
26	IF Amp CH 9	31256	28259 to 32513	P
27	IF Amp CH 10	30856	28259 to 32513	P
28	IF Amp CH 11	30992	28259 to 32513	P
29	DC/DC Conv	31046	28259 to 32513	P
30	IF Amp CH 13	30931	28259 to 32513	P
31	IF Amp CH 14	30986	28259 to 32513	P
32	IF Amp CH 12	30494	28259 to 32513	P
33	RF Shelf A1-1	30953	28259 to 32513	P
34	RF Shelf A1-2	24858	28259 to 32513	F
35	Detector/Preampl	31096	28259 to 32513	P

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 NASA National Aeronautics and Space Administration				Report Documentation Page			
1. Report No. ---		2. Government Accession No. ---		3. Recipient's Catalog No. ---			
4. Title and Subtitle Integrated Advanced Microwave Sounding Unit-A (AMSU-A), Engineering Test Report				5. Report Date December 1998			
				6. Performing Organization Code ---			
7. Author(s) D. Lund				8. Performing Organization Report No. 11357			
				10. Work Unit No. ---			
9. Performing Organization Name and Address Aerojet 1100 W. Hollyvale Azusa, CA 91702				11. Contract or Grant No. NAS 5-32314			
				13. Type of Report and Period Covered Final			
12. Sponsoring Agency Name and Address NASA Goddard Space Flight Center Greenbelt, Maryland 20771				14. Sponsoring Agency Code ---			
15. Supplementary Notes ---							
16. ABSTRACT (Maximum 200 words) This is the Engineering Test Report, METSAT A1 Signal Processor (P/N 1331670-2, S/N F04), for the Integrated Advanced Microwave Sounding Unit-A (AMSU-A).							
17. Key Words (Suggested by Author(s)) EOS Microwave System				18. Distribution Statement Unclassified --- Unlimited			
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of pages ---			
				22. Price ---			

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6. AUTHOR(S) D. Lund				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Aerojet 1100 W. Hollyvale Azusa, CA 91702			8. PERFORMING ORGANIZATION REPORT NUMBER 11357 December 1998	
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